

REMARKS

In response to the above Office Action, claim 1 has been amended to delete "kind of," to include the subject matter of former claim 2 and to limit the upper value of the thickness of the glass cloth to 30 μm . Support for the upper limit of 30 μm can be found in claim 3, which has been cancelled. In addition, withdrawn claim 6 has been cancelled to advance the prosecution of the application. Applicants reserve the right to file a divisional application on the subject matter of claim 6.

In view of deletion of a "kind of " from claim 1, it is believed the claim now meets the requirements of §112, second paragraph. Its withdrawal as a ground of rejection of the claims is therefore requested.

In the Office Action, the Examiner rejected claims 1, 4 and 5 under 35 USC § 102(b) for being anticipated by, or in the alternative, under 35 USC § 103(a), for being obvious over U.S. Patent No. 5,662,990 to Scari et al., hereafter Scari. Now that the limitations of claim 3 have been included in claim 1, it is believed that both of these grounds of rejection are moot. Their withdrawal is therefore requested.

The Examiner also rejected claim 3 under 35 USC § 103(a) for being obvious over Scari in view of U.S. Patent No. 4,911,969 to Ogata et al., hereafter Ogata. In addition, claim 4 was rejected for being obvious over Scari, further in view of Nakamura.

The Examiner also rejected claims 1, 3 and 5 under 35 USC § 103(a) for being obvious over Inoguchi in view of Ogata and Scari or U.S. Patent No. 4,090,002 to Rosenblum and claim 4 for being obvious over these references further in view of Nakamura.

The glass cloth defined in claim 1 has the following requirements.

- (a) The glass cloth is composed of warp yarns and weft yarns of the same glass yarn;
- (b) The thickness of the glass cloth is not less than 10 μm and not more than 30 μm ;
- (c) The ratio of warp yarn width to weft yarn width is not less than 0.80 and not more than 1.20;
- (d) The ratio of the elongation rate in a length direction to the elongation rate in a width direction is not less than 0.80 and not more than 1.20; and
- (e) The glass yarn is sufficiently widened. In other words, the glass yarn is aligned so that the distance between adjacent yarns can be as narrow as possible. (See page 10, lines 9 to 25 of the specification.)

Requirement (e) is obtained by the claimed flattening process as discussed in more detail below.

By subjecting the glass cloth to the claimed flattening process under the low tension conditions set forth, the thickness of the glass yarn can be decreased and the distance between adjacent yarns can be decreased. As a result, a glass cloth satisfying all of the above requirements (b), (c) and (d) can be obtained.

It is realized that while process limitations in product claims limit and define the claimed product, that the patentability of the product depends on the product itself and not on its method of production. However, "the structure implied by the process steps" needs to be considered when assessing the patentability of the claim. This is especially true where the manufacturing process steps impart "distinctive structural characteristics" to the final product. See MPEP § 2113.

Thus, the claimed flattening process itself may not be determinative of the issue of patentability, but since it provides “distinctive structural characteristics” to the claimed product, these structural characteristics must be taken into account when determining the patentability of the claimed product

Scari discloses a glass cloth produced by a gripper loom using a zero-twist yarn. However, and as noted by the Examiner, the glass cloth of Scari is different from that of the present invention because the glass cloth of Scari has a thickness of 45 to 180 μm . (Column 10, line 15 of Scari.)

It might be believed that a person skilled in the art could easily produce a glass cloth having a thinner thickness in view of Ogata. However, in order to obtain a glass cloth having a thickness of that claimed, i.e., 10-30 μm , only by weaving without a flattening process, it would be necessary to make the yarn of the glass cloth thinner by decreasing the diameter of the filaments constituting the glass yarn or decreasing the number of filaments, or by reducing the weave density of the glass cloth at the time of weaving. As a result, a glass cloth having a large distance between adjacent glass yarns would be obtained. In other words, when a glass cloth has a large thickness, a glass cloth having narrow distance between adjacent yarns can be obtained only by weaving.

In contrast, a glass cloth like the present invention cannot be obtained in the absence of the flattening process, even if the glass cloth is woven under low tension. Moreover, if the flattening process is performed under a normal tension exerted on the warp yarns, only the weft yarns will be selectively flattened and a glass cloth different from that of the present invention produced.

This is supported by the experimental results disclosed in the present specification as follows:

The glass cloths of the Examples in the specification are summarized in the following Table 1.

Table 1

	Diameter of filament (a)	Thickness of glass cloth (b)	(b/a)
Example 1	4.1 μm	16 μm	3.9
Example 2	4.5 μm	25 μm	5.6
Example 3	5.0 μm	29 μm	5.8
Example 4	4.1 μm	16 μm	3.9
Example 5	4.5 μm	25 μm	5.6
Figure in Scari			*10

*This value is predicted from the Figure in the abstract of Scari.

In the present invention, because the glass yarns are flattened by the flattening process, each of the number of the warp yarns and the weft yarns is no more than 3 in the direction of the thickness of the glass cloth. This means that the value of (b/a) is not more than 6. In Scari, although the glass yarn illustrated in the cross-sectional figure of Scari cannot be recognized to be a warp yarn or a weft yarn, it is believed from the above that the number of yarns (warp yarns or weft yarns) is 5 in the direction of the thickness of the glass cloth.

Furthermore, an advantageous effect resulting from the flattening process under low tension can be confirmed in the following Table 2, which illustrates the results of the Example 2 and Comparative Examples 2 and 3 of the specification. In Comparative Examples 2 and 3, the glass cloths were produced under the same weaving conditions as in Example 2, but different flattening process conditions from Example 2.

Table 2

	Example 2	Comparative Example 2	Comparative Example 3
Diameter and number of filament	Diameter 4.5 μ m, Number 100		
Weave density	Weft yarn:70/inch, Warp yarn:73/inch		
Weight	23 g/m ²		
Tension in the flattening processing	Low tension	Without flattening process	High tension
Thickness	25 μ m	33 μ m	27 μ m
Warp yarn width/weft yarn width	0.95	0.60	0.50
Ratio of the elongation rate	0.97-0.91	0.78-0.60	0.65-0.53

When flattening was conducted under the claimed low tension exerted on the glass cloth, all of requirements (b), (c), and (d) were met. (Example 2).

In contrast, when weaving was conducted without a flattening process, a glass cloth having none of the requirements (b), (c) or (d) was obtained (Comparative Example 2). When the flattening process was performed under a high tension, a glass cloth having a thinner thickness was obtained, but neither of requirements (c) or (d) was met (Comparative Example 3).

Finally, when weaving is conducted under a low tension, without a flattening process, the ratio of warp yarn width to weft yarn width and the ratio of the elongation rate of warp yarn to weft yarn may be the same levels as those of Example 2, but because the glass yarn has not been flattened, a glass cloth having too large a thickness and too large a distance between adjacent yarns would be obtained.

Thus the Examiner may believe that it would be obvious to make Scari's glass cloth with a thickness of 10 to 30 μ m in view of Ogata, which discloses a thickness for a

glass cloth of from 30 to 100 μm , but, as explained above, this would not result in Applicants claimed glass cloth without the claimed flattening process being performed under low tension on the glass cloth.

Consequently, since neither Scari nor Ogata disclose the claimed flattening process under low tension exerted on the glass cloth as set forth in claim 1, which results in unique structural characteristics in the claimed product not disclosed in either reference, it is submitted that applicants' invention, as set forth in claim 1, cannot be considered obvious over this combination of references. Its withdrawal as a ground of rejection of the claims under § 103(a) is therefore requested.

Regarding the rejections of claims 4 and 5 on pages 4 and 5 of the Office Action, since these claims depend from claim 1, it is believed they are not obvious over the cited references for the same reasons.

It is believed that essentially the same argument can be made against the combination of references based on Inoguchi, Ogata and Scari or Rosenblum. It might be possible to make the glass cloth of Inoguchi having a thickness of 30 μm in view of Ogata, but it would not have the claimed characteristics (c) and (d) unless it was subjected to the claimed flattening process under a low tension. See Comparative Example 3. Since this is not disclosed in any of these references, it is submitted that it not be possible to arrive at the claimed glass cloth of the present invention from this combination of references. Consequently, the claims cannot be considered obvious over this combination of references. Its withdrawal as a ground of rejection of the claims is therefore also requested.

It is believed claims 1, 4 and 5 are in condition for allowance.

Please grant any extensions of time required to enter this response and charge any additional required fees to Deposit Account 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, L.L.P.

Dated: November 6, 2007

By: 

Arthur S. Garrett
Reg. No. 20,338
(202) 408-4091

1478322_1.DOC